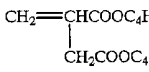
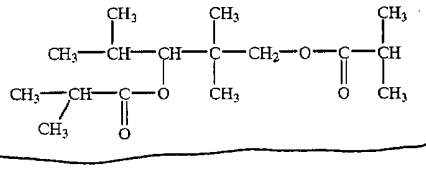


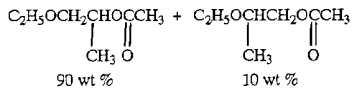
(23) 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate (trade name: Kyowanol D)

($\sigma$=6.24×10$^{-9}$ S/m, $\eta$=4.0×10$^{-3}$ Pa·s)



(26) Propylene glycol ethyl ether acetate (trade name: BP-Ethoxypropyl Acetate)

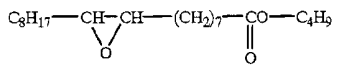
($\sigma$=3.10×10$^{-8}$ S/m, $\eta$=5.0×10$^{-4}$ Pa·s)



90 wt % 10 wt %

(27) 9,10-Epoxy butyl stearate (trade name: Sansocizer E-4030)

($\sigma$=5.46×10$^{-9}$ S/m, $\eta$=2.0×10$^{-2}$ Pa·s)



(28) Tetrahydrophthalic acid dioctyl ether (trade name: Sansocizer DOTP)

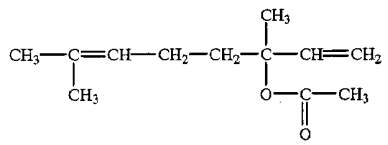
($\sigma$=6.20×10$^{-10}$ S/m, $\eta$=4.0×10$^{-2}$ Pa·s)

(33) 1-Ethoxy-2-acetoxypropane

($\sigma$=4.41×10$^{-7}$ S/m, $\eta$=4.0×10$^{-4}$ Pa·s)

(35) Linalyl acetate

($\sigma$=1.82×10$^{-9}$ S/m, $\eta$=1.3×10$^{-3}$ Pa·s)



(36) Dibutyl decanedioate

($\sigma$=1.35×10$^{-9}$ S/m, $\eta$=7.0×10$^{-3}$ Pa·s)

When a combination of plural compounds is used as the electro-sensitive movable fluid of the invention, the conductivity and the viscosity of a mixture of the plural compounds can be made to be located inside the triangle defined by the points P, Q and R shown in FIG. 1.

In other words, even if each of compounds has a conductivity and/or a viscosity out of the above range, a mixture of the compounds is employable as the electro-sensitive movable fluid of the invention, as far as the conductivity and the viscosity of the mixture are within the above range, respectively.

For example, a mixture (37) ($\sigma$=2.60×10$^{-9}$ S/m, $\eta$=9.8×10$^{-3}$ Pa·s) of 2,2,4-trimethyl-1,3-pentanediol monoisobutyrate (trade name: Kyowanol M, $\sigma$=6.80×10$^{-8}$ S/m, $\eta$=1.2×10$^{-2}$ Pa·s) and 2-ethylhexyl palmitate (trade name: Exepal EH-P, $\sigma$=2.60×10$^{-10}$ S/m, $\eta$=9.5×10$^{-3}$ Pa·s) in a mixing ratio of 1:4 by weight, each having a conductivity and a viscosity out of the above range, is employable as the electro-sensitive movable fluid. Also, a mixture (38) ($\sigma$=4.17×10$^{-9}$ S/m, $\eta$=5.0×10$^{-3}$ Pa·s) of DAM (diallyl maleate, $\sigma$=7.8×10$^{-7}$ S/m, $\eta$=2.5×10$^{-3}$ Pa·s) and butyl stearate (trade name: Exepal BS, $\sigma$=3.1×10$^{-10}$ S/m, $\eta$=8.5×10$^{-3}$ Pa·s) in a mixing ratio of 1:4 by weight, each having a conductivity and a viscosity out of the above range, is employable as the electro-sensitive movable fluid.

The requisite of the electro-sensitive movable fluid of the invention is that the movable fluid has the above-defined conductivity and viscosity. The conductivity and viscosity mentioned above are measured at room temperature, but these property values are known to vary depending on the measuring temperature. The conductivity and the viscosity defined in the invention are irrespective of the temperature. That is, even the compounds having a conductivity and a viscosity out of the above range at room temperature (25° C.) are employable as the electro-sensitive movable fluids, as far as the conductivity and the viscosity of the compounds are within the above range at their working temperatures, e.g., high temperatures or low temperatures. For example, the compound (15), 2-ethylhexyl benzyl phthalate (trade name: Placizer B-8), has a conductivity $\sigma$ of 1.10×10$^{-8}$ S/m and a viscosity $\eta$ of 7.8×10$^{-2}$ Pa·s at room temperature, and even if a direct-current-voltage of 6 kV is applied to the compound at 25° C., the SE type ECF motor or the RE type ECF motor with the compound (25) cannot be driven. To the contrary, a heated product (39) obtained by heating 2-ethylhexyl benzyl phthalate at 100° C., has a conductivity $\sigma$ of 9.90×10$^{-9}$ S/m and a viscosity $\eta$ of 3.5×10$^{-2}$ Pa·s (at 100° C.), and therefore the SE type ECF motor or the RE type ECF motor with the heated product (39) can be driven by applying a direct-current-voltage of 6 kV to the product (39).

On the other hand, at room temperature (25° C.), none of the below-described compounds have a conductivity $\sigma$ and a viscosity $\eta$ located inside the triangle formed by the points P, Q and R in FIG. 1. Therefore, those compounds cannot drive the SE type ECF motor or the RE type ECF motor at 25° C. when they are used singly.

(2) Tributyl citrate (TBC)

($\sigma$=5.71×10$^{-7}$ S/m, $\eta$=2.0×10$^{-2}$ Pa·s)

(3) Monobutyl maleate (MBM)

($\sigma$=2.60×10$^{-5}$ S/m, $\eta$=2.0×10$^{-2}$ Pa·s)

(4) Diallyl maleate (DAM)

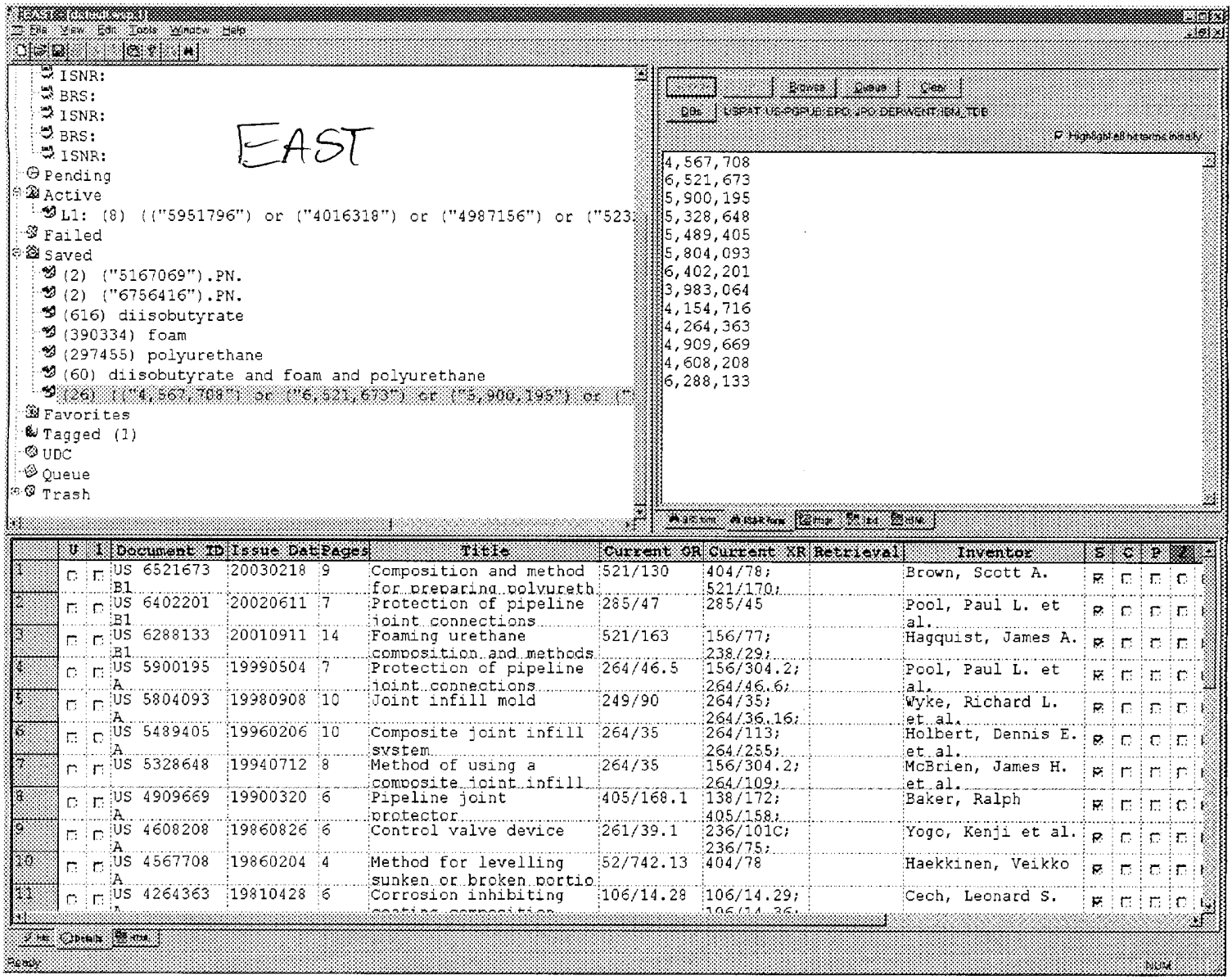
($\sigma$=7.80×10$^{-7}$ S/m, $\eta$=2.5×10$^{-3}$ Pa·s)

(5) Dimethyl phthalate (DMP)

($\sigma$=3.90×10$^{-7}$ S/m, $\eta$=1.2×10$^{-2}$ Pa·s)

(7) Ethyl cellosolve acetate

($\sigma$=7.30×10$^{-5}$ S/m, $\eta$=9.0×10$^{-4}$ Pa·s)




| | U | I | Document ID | Issue Dat | Pages | Title | Current OR | Current XR | Retrieval | Inventor | S | C | P | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | ☐ | US 6521673 B1 | 20030218 | 9 | Composition and method for preparing polyureth | 521/130 | 404/78; 521/170; | | Brown, Scott A. | ☒ | ☐ | ☐ | ☐ |
| 2 | ☐ | ☐ | US 6402201 B1 | 20020611 | 7 | Protection of pipeline joint connections | 285/47 | 285/45 | | Pool, Paul L. et al. | ☒ | ☐ | ☐ | ☐ |
| 3 | ☐ | ☐ | US 6288133 B1 | 20010911 | 14 | Foaming urethane composition and methods | 521/163 | 156/77; 238/29; | | Hagquist, James A. | ☒ | ☐ | ☐ | ☐ |
| 4 | ☐ | ☐ | US 5900195 A | 19990504 | 7 | Protection of pipeline joint connections | 264/46.5 | 156/304.2; 264/46.6; | | Pool, Paul L. et al. | ☒ | ☐ | ☐ | ☐ |
| 5 | ☐ | ☐ | US 5804093 A | 19980908 | 10 | Joint infill mold | 249/90 | 264/35; 264/36.16; | | Wyke, Richard L. et al. | ☒ | ☐ | ☐ | ☐ |
| 6 | ☐ | ☐ | US 5489405 A | 19960206 | 10 | Composite joint infill system | 264/35 | 264/113; 264/255; | | Holbert, Dennis E. et al. | ☒ | ☐ | ☐ | ☐ |
| 7 | ☐ | ☐ | US 5328648 | 19940712 | 8 | Method of using a composite joint infill | 264/35 | 156/304.2; 264/109; | | McBrien, James H. et al. | ☒ | ☐ | ☐ | ☐ |
| 8 | ☐ | ☐ | US 4909669 A | 19900320 | 6 | Pipeline joint protector | 405/168.1 | 138/172; 405/158; | | Baker, Ralph | ☒ | ☐ | ☐ | ☐ |
| 9 | ☐ | ☐ | US 4608208 A | 19860826 | 6 | Control valve device | 261/39.1 | 236/101C; 236/75; | | Yogo, Kenji et al. | ☒ | ☐ | ☐ | ☐ |
| 10 | ☐ | ☐ | US 4567708 A | 19860204 | 4 | Method for levelling sunken or broken portio | 52/742.13 | 404/78 | | Haekkinen, Veikko | ☒ | ☐ | ☐ | ☐ |
| 11 | ☐ | ☐ | US 4264363 | 19810428 | 6 | Corrosion inhibiting coating composition | 106/14.28 | 106/14.29; 106/14.36; | | Cech, Leonard S. | ☒ | ☐ | ☐ | ☐ |